

Date: Thu, 18 Aug 94 04:30:19 PDT
From: Ham-Ant Mailing List and Newsgroup <ham-ant@ucsd.edu>
Errors-To: Ham-Ant-Errors@UCSD.Edu
Reply-To: Ham-Ant@UCSD.Edu
Precedence: Bulk
Subject: Ham-Ant Digest V94 #268
To: Ham-Ant

Ham-Ant Digest Thu, 18 Aug 94 Volume 94 : Issue 268

Today's Topics:

 How to phase two loops for satellite
 Power reduction - Why ?
 Should feedline length change the VSWR?
 Should feedline length change the VSWR?
 tunor humor

Send Replies or notes for publication to: <Ham-Ant@UCSD.Edu>
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Problems you can't solve otherwise to brian@ucsd.edu.

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We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Tue, 16 Aug 94 13:57:23 PDT
From: munnari.oz.au!foxhound.dsto.gov.au!fang.dsto.gov.au!yoyo.aarnet.edu.au!
news.adelaide.edu.au!news.cs.su.oz.au!harbinger.cc.monash.edu.au!
yeshua.marcam.com!news.kei.@@ihnp4.ucsd.edu
Subject: How to phase two loops for satellite
To: ham-ant@ucsd.edu

I want to homebrew a M2 type eggbeater antenna for the 10 meter RS satellites
downlink, however I not quite sure on how to tie them together at the feed
point.

The eggbeater antenna is two circular loops at 90 deg to each other, both feed
180 out of phase, into a 50 ohm coax feed. The phase will determine if its
right or left hand circularly polarized overhead. I don't want to use 75 or 93
ohm coax delay lines, to bulkey. I would rather use some sort of small L/C
circuit what I can mount into a small 1x2 inch box with a S0239 on it. This is
for receive only, so RF power handling capabilities is not a concern. I've seen
this done at a field day site, however I didn't get the configuration of the

box.

Any diagrams, part values or just ideas are welcome.

73s, WB7ASR...

tom_boza@ccm.hf.intel.com

Date: 18 Aug 94 14:46:38 GMT
From: news-mail-gateway@ucsd.edu
Subject: Power reduction - Why ?
To: ham-ant@ucsd.edu

Hello folks,

Being on vacation, I missed most of the discussion, about coax length affecting SWR, but during the same period I faced a problem with the temporary setup of a friend of mine, in one of the Greek islands. So I thought of posting it here, since my technical expertise is nothing to write home about.

Here is what happened. Both me and my friend (SV1BT0) have Kenwood TM-732's. We've been using them for more than a year now, and the power readings for both rigs, were almost identical (within instrument tolerance), when he was at his shack and I was at mine (about 50 watts in VHF and 35 watts at UHF, at the higher settings of the rigs).

When he went on vacations, he got a new Diamond X-200 antenna, which was put up, on a small mast at the balcony of his summer house. The antenna is almost completely above the roof. The coax used is RG-58, of about 30-40 feet length. He used his TM-732 on this setup, and he noticed that although the SWR was quite good (about 1.2:1) in both bands, the transmitted power, in UHF, was -only- about 20 watts, at the rig's higher setting (instead of about 35). When we talked about this on the air, I somehow got skeptical. How can it be? I mean, I know that RG-58 is lossy, but THAT MUCH LOSS is TOO MUCH. Both in my home and in his, the coax is RG-213, but the length is *quite* longer, and we have never faced this problem.

I suspected some problem with his rig, so when I went visit him, I brought my TM-732 with me. Same exact behaviour. Output power 20 watts, similar with both transceivers.

Now, could some helpfull soul enlighten me, about this? Could it be that some capacitors are blown in his antenna (I think I read this somewhere) ?

We would both appreciate any thoughts or comments

Best 73 de John (SV1CEC)

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+-----+
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+-----+
|  DISCLAIMER : For all these, you can only blame me, nobody else! |
+-----+
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Date: 17 Aug 1994 21:30:02 -0400
From: newstf01.cr1.aol.com!search01.news.aol.com!not-for-mail@uunet.uu.net
Subject: Should feedline lenght change the VSWR?
To: ham-ant@ucsd.edu

Let me start by thanking everyone who has taken time to respond with ideas and advice. I have been out of town on vacation for several days and am amazed at the volume of replies. There have been many well thought out replies, so many in fact I have lost track of who said what. I have a few quotes here and I hope the original posters will forgive me for not taking the time to correctly identify them.

>The original poster can not visualize what is happening with his
>antenna system...he is confused, because he can not effectively
>convert his book knowledge of antennas and transmission lines into
>a plan to effectively trouble shoot his new antenna and it's
>associated transmission line.

Boy was this comment correct. This is my hobby and antennas are not my career (thank goodness.)

>Even if you were to use an actual VSWR measuring instrument, such
>as a reflectometer, you'd still have the currents *on the outside
>of the coax shield* to contend with. These will upset the VSWR
>instrument reading. The velocity factor on the *outside* of the
>coax shield is near 1 while the velocity factor *inside* the coax
>is typically near 0.66, so the out of phase situation will vary
>*along the length* of the cable. In fact, a good test for RF on
>the *outside* of a coax cable is to take two VSWR readings at
>different distances along the cable. If they differ by more than
>can be accounted for by coax loss, you have RF on the outside of
>the shield. That's certainly the case here. The coax is acting as
>part of the antenna radiating system.

From reading everyones replies I think this best sums up the situation. Obviously the antenna is very imbalanced and there is current flowing on the outside of the cable. I think I am hearing that this is messing up the readings I am getting, not that the SWR is really changing. Could this be why the company recommend 65 feet of feedline? The "Ham Quality" meter most of us have will show a good match with that particular length?

>Failure to follow factory recommendations in trouble shooting
>means that your conversations with him are *probably* a waste
>of *his* time. The factory rep is 1,000 miles from your
>antenna...he may have a standardized procedure for analyzing
>problems *by telephone*...and I'd advise against rejecting his
>*requirements* in order to help you.

I haven't ruled out what the factory guy said. I was trying to understand what he was trying to tell me rather than waste his time on the phone. Also, I couldn't quite bring myself to cutting up the feedline with out knowing why I was doing it and that it was for a valid reason.

There was at least one comment on the fact that I didn't mention by name the manufacturer of the antenna. I didn't mention it for several reasons. First, I didn't want to come across as "flaming" the company for something that very well might be my fault not theirs. Thats how I would want to be treated if the shoe were on the other foot. And second, I didn't want the brand of the antenna to alter or color the responses.

The antenna is advertised as being a "No Tune" antenna and the instruction book doesn't give any info on how to change the band centers on any band other than 80 M which requires changing a part that the factory supplies upon request. I am using brand new RG-213 that I tested with the connectors in place before installing it in the system. It met the manufactures spec's for 100 feet of that type of cable (at least with my Ham Quality test equipment.)

I think it sounds like I should either choke off the current flowing on the outside of the line or cut the feedline to 65 feet and fool the SWR meter and rig into thinking that the SWR is correct (which it may well be if I could measure it with a broadcast quality meter.) or fork out the green stuff for a high quality piece of test equipment. I'll probably try the choke first if I can find the stuff here in the wilds of Idaho since I don't have

to chop up the cable to do it and don't have the money for the test equipment method.

Again thanks for the messages, I've learned a great deal so far and I'm sure I'll learn more before I'm finished.

Terry KJ7F

Date: 18 Aug 1994 00:11:30 GMT
From: news.tek.com!tek4.cse.tek.com!royle@uunet.uu.net
Subject: Should feedline length change the VSWR?
To: ham-ant@ucsd.edu

Even though the original poster's question has long since been answered, this thread has raised a couple of points I'd like to add my 2 cents' worth to.

First, the original matter of SWR changing with transmission line length. Yes, it can happen. If it does, it's most likely due to one or more of the following three causes:

1. Line loss. This will cause the SWR to decrease as more line is added.
2. Current on the outside of the transmission line. The SWR changes because changing the line length is having two separate effects: You're changing the length of transmission line carrying power on its inside to the antenna, and you're changing the antenna, which in this case includes the outside of the transmission line. In the ideal case, the first effect doesn't change the SWR. But the second does.
3. The impedance of the SWR meter doesn't match that of the line. This may be more common than you think. I recently measured several pieces of RG-58 I had lying around, and found the impedances to range from 51 to 61 ohms.

Bad connectors and the like are other possible causes. All these have been mentioned but I thought it might be helpful to have them in one spot.

Now for the other topic, that of using magic vs physics to explain antenna, transmission line, or for that matter, rf, microwave, or EMI phenomena. Gary Coffman's response was well-put and I'd like to add my agreement to it. All these phenomena have to follow rules. The rules are the laws of physics. If you ever catch them NOT obeying the laws of physics, you're on your way to fame and fortune! A curious thing happens as you learn more about physics

and electromagnetics: the occurrence of magical phenomena decreases. When you see a phenomenon which contradicts known principles, you can respond by rejecting all the principles, or you can learn from the experience. Either you're not observing what you think you are (for example, the reading of an "SWR" meter when connected to a cable of the wrong impedance isn't measuring the SWR on the cable) or you're misapplying the principle (such as using the principle that changing the line length doesn't alter the SWR - true only for lossless line - in a case with lossy line). I don't learn much when my design works like I planned. The learning comes when it doesn't, and I have to figure out why.

Consider the "magic" equipment in everyday use -- cellular telephones, satellite communications, or one which I'm very well acquainted with, oscilloscopes with DC-50 GHz response -- the list goes on and on. Do you think the engineers designing this stuff are using their Ouija boards and casting spells? For a hint, pick up any of the trade magazines like _Microwaves and RF_, _Microwave Journal_, _RF Design_, or _EMC Test & Design_. What you'll find are equations, not recipes with lizard livers. Because the equations work.

I do have to add a loud cautionary note, though. Particularly in amateur publications, a lot of the "authoritative" information is misapplied or just plain wrong. The only protection I know of against getting really bad information from this source is to get familiar with the authors and their track records. Some magazines do a better job of reviewing articles than others, but bad papers still slip through all too often. The _ARRL Handbook_ and _ARRL Antenna Book_ are both very good references, with a relatively small number of inaccuracies. (Boy, I bet the flames'll be stirred by that statement. But it's true.) I personally think the net is a good source of information, though you might have to wait a little while for the right answer. Postings of inaccurate information are frequent, but someone nearly always jumps in and corrects the errors -- as they have in this case.

Well, I better climb down off my soapbox and get out the Tarot cards. I've got work to do.

73,
Roy Lewallen, W7EL
roy.lewallen@tek.com

Date: 17 Aug 94 13:30:00 -0500
From: ulowell!ulowell!aspen.uml.edu!martinja@uunet.uu.net
Subject: tunor humor
To: ham-ant@ucsd.edu

In article <1994Aug15.200315.29904@newsgate.sps.mot.com>, kinzer@dtsdev0.sps

.mot.com (Dave Kinzer) writes:

>> In article <32gk09\$rgb@chnews.intel.com> Cecil_A_Moore@ccm.ch.intel.com wrote:

>>Where the heck can I mount a -8 ft long antenna?...

> Anywhere you want! You do have to remember to reverse your repeater offsets
> and sidebands.

Uh scuze me fer buttin' in here....I'm interrupt driven....(hic). I read somewhere you have to have a PhD to do this. Post hole Digger?

You know if you install an antenna above ground a mirror image exists below ground. This case uses the opposite principle. You bury the antenna and the mirror image occurs above ground. This way you can get by with what PRB-1 can't.

You have to tamp the soil down good too. That way you can get *ALL* of the dug out soil back into the hole. Oh yeah, the deeper you place the antenna the higher the mirror image will be. The only set back is your antenna will have to be replaced after a few years, especially if the soil is very acidic in nature. What corrodes below ground will also corrode in the mirror image. That air rust is tough to breathe. So is the aluminum oxide powder from the mirror image.

Hope this helps.

Hey! It sounded good as I thought it up. 8-D

73 de WK1V

-jim-

Next week we tackle mirror image impedance and its affect on the life-cycle of the carpenter ant.

End of Ham-Ant Digest V94 #268
